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ENERGY REPORT

A PUBLICATION OF THE MASSACHUSETTS DIVISION OF ENERGY RESOURCES

Vol.4/ No.1
Winter 1996

The Commonwealth of Massachusetts

William F. Weld, Governor

Argeo Paul Cellucci, Lt. Governor

David Tibbetts, Secretary Economic Affairs

David L. O'Connor, Commissioner Energy Resources

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A Sweetheart Of A Deal

BUSINESS

When the Shapiro brothers from Chelsea, MA founded the Sweetheart Company in 1910 to manufacture ice cream cones, interest in energy conservation was furthest from their minds. Now, 80 years later, Sweetheart Cup Company (Plastics Division) in Somerville, MA, the nation's largest producer of disposable dinnerware, has made energy conservation a top priority. An employer of 300 people in Somerville alone, and supplier to McDonald's, Wendy's, Ben & Jerry's, and H.P. Hood, Sweetheart recognized that to remain competitive and maintain their customer base, they needed to continuously improve efficiency and lower costs. Their research, combined with a reference from a friend, led them to DOER's Energy Advisor Service.

"I wish I'd had access to a similar service when I was the plant manager in California, or today for the New Hampshire facility," said Wes Bush, Somerville plant manager. "The professionalism and quality displayed (by the EAS engineers) was excellent."

The Energy Advisor Service offers technical assistance to manufacturers to help them identify and act on energy efficiency opportunities. The program uses private sector engineers to develop flexible, comprehensive energy efficiency analyses of manufacturing processes and facilities. Investments made in measures identified by EAS typically are paid back through energy savings in less than three years.

In January 1995, Sweetheart Cup began work with the EAS engineers. Three months later, the engineers presented a report to Sweetheart officials analyzing 13 energy efficiency project opportunities. Projects identified at the Somerville facility included: modification of the air compressor system, and the installation of variable speed drives to process pumps and fans, lighting upgrades, and premium efficiency motors.

The EAS team also substantiated the energy efficiency of an innovative pilot manufacturing project already underway at the plant. The project uses gas infrared heaters rather than the typical cal-rod electrical heaters in the thermoforming or "plastic molding" process. This modification

SWEETHEART: Continued on page 7.

ELECTRIC INDUSTRY RESTRUCTURING HEARINGS UNDERWAY

Deregulation ... Restructuring ... Retail Wheeling. Whatever your term of preference, they all signal a revolutionary change in the electric utility industry.

According to recent reports, more than 41 states have embarked on some form of investigatory process. As you read this, Massachusetts will be undertaking hearings and continuing negotiations on the restructuring plans proposed by the Commonwealth's four largest investor-owned utilities—Boston Edison, Eastern Edison Company, Massachusetts Electric Company and Western Massachusetts Electric.

In their filings, the companies addressed four issues outlined by the DPU:

- How restructuring would promote competition, economic efficiency and expand opportunities benefiting consumers;
- How to extend the option of choice to consumers;
- How restructuring could be implemented; and
- The necessary and appropriate regulatory mechanisms.

To assist the DPU, DOER filed **Power Choice**, its recommendation for restructuring. **Power Choice** discusses the issues outlined above and lays out provisions for a new, free market structure. It addresses issues including: rate relief, reliability and consumer protections, stranded costs, performance-based ratemaking

RESTRUCTURING: Continued on page 5.

FROM COMMISSIONER O'CONNOR

Massachusetts needs a collaborative process to advance the restructuring of the state's natural gas industry. As a result of federal restructuring and deregulation, the production and transmission sectors of the gas industry are now competitive. However, participation in these competitive markets does not extend to all retail customers. Instead, participation is primarily limited to large-volume industrial customers. Additional restructuring efforts must occur at the state level to ensure equal opportunities and participation for all customer classes.

Over the last year, Massachusetts has made important progress toward introducing competition into the electric utility industry. The *Principles of Electric Industry Restructuring*, negotiated by various parties and reflected in the Department of Public Utilities' (DPU) August 1995 order, are considered by many to be a model for other states to follow. These principles served to guide the plans for electric utility restructuring filed with the DPU in February.

One of the major reasons for the significant progress towards a competitive electric industry in Massachusetts has been the negotiated approach, encouraged by the DPU, to this complicated and controversial endeavor. I am pleased that the Division of Energy Resources, as part of this process, has been able to sponsor the roundtable discussions among electric industry stakeholders.

The fundamental goals of further restructuring in the Massachusetts natural gas industry are clear:

- Increase opportunities for customers choice;
- Insure fair competition among all providers of gas services;
- Achieve lower burner-tip gas costs for all customers;
- Encourage the economically and environmentally efficient use of natural gas by all customers; and
- Maintain existing reliability and standards.

In Massachusetts, a number of DPU dockets have begun to address gas competition-related issues. However, customers and other affected parties have not effectively aired their views regarding these issues. A consensus building approach is needed to allow all interested parties to address complex issues such as unbundling production and transportation services for residential customers.

Toward that end, DOER will begin discussions with stakeholders to develop, by consensus, a more comprehensive approach to the restructuring of the natural gas market. We will build on the achievements and experience gained in Massachusetts' electric utility restructuring process. We will also look to other states — Maryland, New Jersey, New York, Ohio, Wisconsin and Wyoming — who are already using a comprehensive, consultative approach to ensure a smooth transition to a fully competitive gas industry.

We look forward to working with you toward a natural gas market from which the gas industry and all its customers will benefit.

DOER INTERVENES IN GAS CASES

STATE

During 1995, DOER intervened in two gas cases before the Department of Public Utilities (DPU) in an effort to expand fair and equitable competition in the natural gas industry.

In the Bay State Gas Transportation Rate Redesign case (DPU 95-104), DOER questioned the company's proposed changes to the transportation charges for different types of customers. Bay State Gas had been charging a demand-based rate to its "transportation" customers — customers who purchase from the LDC, only the local transportation, not the gas sales service. This means that Bay State Gas based its charges on a customer's maximum peak usage during a given period (e.g. mcf/day), whether or not the company delivered that amount of gas at all times during the billing period.

For all other customers, the company used a volumetric-based rate -- customers were charged for the actual amount of gas (in therms or mcf) that was delivered to them over the billing period. In their filing, Bay State Gas proposed to use the volumetric-based rate for all customers as part of an effort to ensure comparability.

DOER agreed with the company's need for full comparability, but argued that the demand-based rate was more appropriate for transportation customers. In a settlement reached between DOER, the Attorney General's Office, other parties, and the company, Bay State Gas agreed to use demand-based transportation rates for its largest sales and transportation customers beginning May 1, 1997. The agreement was approved by the DPU.

Bay State Gas also agreed to file a new, collaboratively designed rate-making plan by May 31, 1997. The plan will include price caps or other incentive systems to squeeze out inefficiency, drive down costs and tie rates to customer service and other utility performance measures.

Another key element of this settlement is an experimental pilot program to "unbundle" gas services for participating residential customers. This would separate sales,

GAS CASES: Continued on page 6.

ENERGY ENGINEERING PROGRAM HELPS LOCAL GOVERNMENTS SAVE MONEY

LOCAL

What do Hampden County and Everett's public school district have in common? They are both saving taxpayer dollars and valuable resources with the help of DOER's Energy Engineering Program. In its first year, EEP has helped 15 municipalities and counties identify more than $7 million in energy costs.

This program helps local and regional governments and school districts obtain private capital for energy and water efficiency improvements. EEP provides technical assistance for privately financed renovation projects and design review services for new construction projects. This "behind the scenes" support results in substantial benefits for participants.

Through third-party financing with energy services companies (ESCOs), governments and school districts forego up-front payments on their energy efficiency improvement projects. Instead, annual energy and water savings pay for energy efficiency measures.

For example, Hampden County found that it could save over $300,000 in annual energy costs from a total capital investment of $1.6 million. This investment would finance lighting retrofits, conversion of the fan coil units and domestic hot water to gas, expansion of the energy management system and heating, ventilation and air conditioning retrofits. Hampden County competitively hired an ESCO to finance the measures. The work will save 3.8 million kilowatt hours per year — or over $300,000. Of that savings, Hampden County will use $118,814 annually to repay the financing to the ESCO.

For this project, DOER's EEP Engineers conducted a walk-through evaluation of the county's Hall of Justice. Next, the EEP engineers reviewed and evaluated technical documents prepared by the ESCO. County officials will use this technical information to develop their final contract with the ESCO. EEP will help the county will be ensure high quality workmanship and appropriate equipment installation under the ESCO funded project.

The Everett School District enjoyed a similar experience. According to Rich Wallace, business manager for the City of Everett, "Without the EEP engineers and program management staff, our participation (and) financing would not have been possible."

Everett is implementing energy saving projects at its high school and Centre Elementary School. Their current energy bill is $430,000. After making the third-party financed energy efficiency improvements, the school department expects to reap more than $43,000 in energy cost savings per year.

The total anticipated capital investment is approximately $1 million. Major projects include new lighting, motors and improvements to HVAC units. In addition to the third party private financing, Everett is also taking advantage of existing energy efficiency improvement rebates from Massachusetts Electric and Boston Gas. Work on the projects will begin this summer.

While local governments and school districts improve the environment and increase energy efficiency through the Energy Engineering Program, their greatest benefit is the savings of taxpayer dollars. With these savings, they may be able to accomplish another challenging and difficult goal — the expansion of services in their respective communities.

For more information on the Energy Engineering Program, contact Terry Civic, Program Manager, at (617) 727-4732 ext. 137.

DOE ISSUES SECOND ANNUAL REBUILD AMERICA FINANCIAL SOLICITATION

The U.S. Department of Energy is calling for proposals under its Second Annual Rebuild America Program. Rebuild America provides technical and financial assistance awards to community and regional partnerships for large-scale energy efficiency retrofit projects. Any company or organization can lead a partnership, however it must include a representative of state or local government.

Project designs must improve energy usage in commercial or multifamily buildings. Activities relating to operating the partnership or the building retrofit process are eligible for funding. Capital equipment purchase or installation costs are not eligible under this program.

Rebuild America's main goal is to save commercial and multifamily building owners and tenants $650 million a year by the year 2000. Other aims are to spur economic activity, increase comfort for building occupants, reduce pollution and create jobs.

For more information, call Christine McKay at DOE, (617) 565-9711, or contact the Energy Efficiency and Renewable Energy Clearinghouse at (800) 363-3732.

Siting Reform: The Time is Now

by John B.Howe, Chairman, Department of Public Utilities and Energy Facilities Siting Board

Once again, *EnergyReport* offers these pages for a guest editorial. As the DPU holds hearings on the deregulation of the electric industry, energy facility siting will be a key issue for many participants. *Facts and opinions expressed in this editorial are those of the author and not necessarily those of the Division of Energy Resources.*

The topic of energy facility siting reform has recently attracted a lot of attention within the Massachusetts energy community. As the Energy Facilities Siting Board's (EFSB) new chairman, I want to emphasize that the EFSB is actively committed to reform. I would like to thank DOER for this opportunity to explain my perspective and to respond to concems that taking action now on siting reform would be premature given that we are on the eve of restructuring the electric industry.

Simply put, it is not the prospect of a restructured electric industry that is driving the need for siting reform. Rather, it is the reality -- crystal-clear after 8 years of adjudicating non-utility facilities' applications, and numerous court battles -- that the EFSB cannot conduct a meaningful review of an independent (non-utility) electric power project under our existing statute. Why not? Because, in my view, the statute was designed to regulate the siting of **utility** projects.

Under the Massachusetts siting statute, as a complement to its siting authority, the EFSB (originally called the Energy Facility Siting Council, or EFSC) was charged with reviewing utility forecasts on a regular basis to determine when new facilities were required to meet increased customer need. When a forecast demonstrated need for new capacity, the EFSC reviewed all the options available to a utility to ensure that it picked the least-cost, least-environmental-impact altemative.

This model, however, just doesn't fit the circumstances of an Independent Power Producer (IPP) developer, which does not have a franchised service territory for which future electricity needs can be forecast. In place of a service territory forecast, therefore, the EFSC originally required IPP developers to provide analyses demonstrating need for a project within the ***New England region***. The analyses had to be supplemented by power sales contracts that utilized the increased generation.

When need was demonstrated, the EFSC would conduct an analysis of generic alternate projects in place of the options analysis required under utility applications. Later, recognizing that this comparison was flawed, the EFSC proposed to defer the review of alternatives to the Department of Public Utilities' Integrated Resource Management (IRM) process, where real projects compete against each other, against renewables, and against conservation. This approach faltered when the Supreme Judicial Court (the Court) ruled in 1992, and affirmed in 1994, that the Siting Board must review the need for independent power projects ***only within Massachusetts.***

> **"...IT IS IMPERATIVE THAT THE ENERGY FACILITIES SITING BOARD'S STATUTE BE REFORMED, REGARDLESS OF INDUSTRY RESTRUCTURING."**

Certainly, pending statutory reform, we are bound to comply with the Court's order to review Massachusetts' need for independent power projects. But we are very concerned that this review asks the wrong question.

In the Board's view, a review that only references Massachusetts is a legal fiction, and is unrelated to the way that the electric system works. Massachusetts is part of a regional energy grid; we are a net importer, using energy from other New England states, New York, even Quebec. An analysis of the energy balance within our borders would lead to the conclusion that new power is needed now, even in the face of a current regional surplus.

The Court's decisions on the issue of alternatives are also troubling. The Court has favored the old approach of reviewing generic alternatives and rejected our deferral of the comparison to the DPU's integrated resource planning process. Unfortunately, when a real, carefully engineered project is compared to a generic alternative, the real project wins every time. More important, this analysis is as much of a legal fiction as the Massachusetts' need analysis. Decisions about whether Massachusetts will be served by fossil fuels, hydropower, wind, or conservation are made by utilities and their customers, not by independent power developers. Therefore, the review that counts is the review of a utility's resource decisions.

Our efforts to address these flaws, unfortunately, have clashed with the Court's recent interpretation of our statute. Yet we believe it is wasteful and inefficient to conduct irrelevant analyses of Massachusetts' need and generic alternatives. My conclusion is that it is imperative that the EFSB's statute be reformed, regardless of industry restructuring.

Certainly, while the need for reform stands on its own, any revision to the statute must be made in contemplation of the coming, more competitive electric industry. In this regard, some issues that warrant particular attention include the following:

- Administrative determination of need: In a truly competitive industry, the market should determine whether new generation is needed. Should determinations of need for new generation be eliminated outright?
- Displacement of existing capacity: In a restructured electric industry,

SITING REFORM: Continued next page.

SITING REFORM: From page 4

environmental and economic benefits may result from the displacement of existing generation by new, cleaner and more efficient plants. Can such benefits be realized within a framework that focuses simply on capacity need?

- Consistency of requirements: Effective competition requires a level playing field between utility and non-utility projects. How can we ensure that plants compete on the basis of their merit, not the identity or legal status of their proponent?
- Allocation of investment risk: Electric customers should not bear the cost risk for plants built to compete in the market. Our staff proposal broke the link between EFSB approval and DPU decisions about cost recovery. Are there other viable proposals to achieve this end?
- Protection of "stranded benefits": Restructuring and retail competition have implications for the promotion of such goals as energy efficiency, renewable resources, cleaner fossil fuel plants, and fuel diversity. Yet the EFSB, given its limited jurisdiction over the siting of new, large, in-state facilities, is not suited to assure the attainment of these goals. What other means are available to ensure that these goals receive appropriate recognition as the marketplace develops?
- Siting of transmission lines: In a restructured electric industry, the siting of transmission lines may take on greater importance. What, if any, changes to the EFSB's current processes are warranted in this regard?
- Eminent domain and override powers: Is it appropriate for a competitive generating industry to benefit from the Siting Board's eminent domain and override powers?

Many within the industry have expressed concern about the timing of the EFSB's initiative. As a matter of tactics, some question whether a push for siting reform now would distract attention from later, broader restructuring legislation. Yet if we do not engage the issue, there is a danger that the legislature will act without us. The EFSB, in short, must actively guide its fate. Otherwise we risk more drastic and, in my view, ill-considered actions that could "restructure" the Board out of existence altogether. I strongly support a narrowing and re-focusing of our functions, but reject suggestions that the Board should be eliminated outright.

On a more substantive note, some have expressed concern that the role of the EFSB cannot be defined without more certainty about the future structure of the electric industry. Such arguments are unpersuasive. The uncertainty about restructuring is not boundless; proposals have been circulating for some time, here and elsewhere, that give some definition to the issue. Further definition will result from the restructuring proposals that were recently filed by the Commonwealth's largest utilities.

I will be eager to hear interested parties' views as to which specific uncertainties about the industry's future are truly relevant to the topic of siting reform. The staff and I are eager to join the energy community in tackling and resolving this difficult issue.

For more information on DPU siting reform efforts, contact Diedre Matthews at (617) 727-3500 ext. 1136.

ELECTRIC INDUSTRY DEREGULATION: From page 1

policies and continued support for conservation and renewables. The plan also recommends a transition timetable.

The filings follow a year-long process of investigation, discussion and design in which DOER played an active role. Last June, DOER began a series of meetings on the complex issues of restructuring. From these meetings, a coalition of 19 parties, including utilities, consumer and environmental advocates, and state agencies developed the *Interdependent Principles of the Massachusetts Electric Industry Restructuring Roundtable*. These *Principles*, filed with the DPU in July, provided a consensual framework from which restructuring plans could be developed. The *Principles* were strongly backed by the DPU in its August '95 order on restructuring.

The scheduled DPU Public Hearings on the filings are:

- Tuesday, March 5 - Massachusetts Electric Company, City Hall, Room 409, Worcester, MA, 7:30 p.m.
- Wednesday, March 6 - Procedural Conference, State House, Gardner Auditorium, Boston, MA, 10:00 a.m.
- Wednesday, March 6 - Eastern Edison Company, City Hall, G.A.R. Room, Brockton, MA, 7:30 p.m.
- Tuesday, March 12 - Western Massachusetts Electric Company, Murray D. Lincoln Campus Center, Room 174-76, University of Massachusetts, Amherst, MA, 7:00 p.m.
- Wednesday, March 13 - Boston Edison Company, City Hall, Conference Room 801, Boston, MA, 7:30 p.m.
- Thursday, March 28 - Division of Energy Resources, City Hall, Newton, MA, 7:30 p.m.

DOER will continue to promote discussion and to seek agreement on important issues in the plans filed with the DPU. DOER is hopeful that the ongoing dialogue and cooperation among the concerned parties will help shorten the hearing process and promote settlements among key parties on critical issues.

For more information, contact Fran Cummings, Director of Policy, or Vicki Pitluk, Director of Public Information, at (617) 727-4732.

ENERGY CONSERVATION CONTEST ANNOUNCED

The Industrial Services Program (ISP) is sponsoring an Energy Conservation Contest with awards of up to $25,000 each. The contest is part of ISP's campaign to encourage high performance and competitiveness among Massachusetts businesses, particularly through energy efficient and environmentally conscious methods.

ISP is inviting both small and medium-sized Bay State manufacturers to submit proposals for in-depth feasibility and design studies that identify methods of reducing energy, water, and waste generation operating costs. Winning studies will be eligible for 50 percent reimbursement of costs, up to a maximum of $25,000. The deadline for proposals is March 22, 1996.

The Industrial Services Program is a quasi-public agency established to address the impact of rapid economic change and to improve the competitiveness and success of Massachusetts-based companies and their workers. *For more information, call (617) 727-8158.*

EPA GRANT WILL HELP NEW ENGLAND STATES PROMOTE ENERGY EFFICIENCY AND RENEWABLES

REGION

The push to deregulate the electric power industry presents many challenges for federal and state regulators. Efforts to increase competition and reduce regulatory control are growing. What will be the impact of electric utility deregulation on demand side management, energy efficiency, renewable energy, and other environmentally sustainable technologies?

A partnership of the six New England state energy offices, led by the Division of Energy Resources and the New England Governor's Conference, is looking for answers to this important public policy question.

Under a grant from the U. S. Environmental Protection Agency, the partnership is working to identify changes in regulatory and other governmental policies and programs that may be needed to promote energy efficiency, renewable technologies and pollution control in a deregulated electric market.

Because the successful implementation of environmentally sustainable technologies will have far reaching benefits for many parties, the partnership is working with utilities, consumer groups, environmental advocates and other stakeholders in this effort. Work is also underway to identify mechanisms to foster voluntary, marketplace actions that support environmentally sustainable technologies.

The partnership plans to publish a set of innovative, recommended legislative, regulatory, procedural and program changes for use at the state and federal levels. The goal is to identify changes that:

- Boost the growth rate and market penetration of firms that develop, install, operate, and maintain energy efficient and sustainable technologies to boost new jobs and economic development, and
- Reduce air, water and land pollution to result in better health and quality of life for the region.

For more information, contact Howard Bernstein, Policy Analyst, at (617) 727-4732 ext. 155.

GAS CASES: From page 2

pipeline transportation and distribution services to bring competition and choice to participating residential customers, and lead to lower prices and better service. The program is due to begin at the start of the 1996/97 heating season.

In the Commonwealth Gas (COMGas) Transportation Rate case (DPU95-102), DOER recommended that the company file a more comprehensive and updated rate design plan before implementing any proposed rate changes. DOER also suggested that COMGas submit a new filing to address other issues such as the release of capacity on the interstate pipelines to gas marketers and the unbundling of services for residential customers.

In December, the DPU ordered COMGas to file a more comprehensive plan before charging its proposed rate to ***existing*** transportation customers. The order allows COMGas to charge the proposed rate to any ***new*** transportation customers.

For more information, contact Joanne McBrien, Policy Analyst, at (617) 727-4732 ext. 145.

CHICOPEE LANDFILL GAS GENERATION PROJECT RECEIVES NATIONAL RECOGNITION

LOCAL

Most people think of landfills as dirty, smelly places that don't have any redeeming qualities. The City of Chicopee however, is changing this negative mindset through an innovative and award winning energy producing project. This project, the first of its kind in Massachusetts, recovers methane gas from a landfill and recycles it into electricity.

The Chicopee Municipal Lighting Plant recently received a Special Recognition Award from the U.S. Department of Energy (DOE) for this landfill gas generation project. DOE presented the award through its 1995 National Awards for Energy Efficiency and Renewable Energy program.

Landfills are large generators of methane gas. The Chicopee landfill alone produces as much as 1.7 million cubic feet (48,000 cubic meters) of the gas each day. The gas forms when highly compacted trash, overlain with soil, decomposes anaerobically (without oxygen). Methane gas is highly combustible and about ten times more potent than carbon dioxide as a greenhouse gas. Chicopee minimizes the impact of methane gas and realizes benefits by capturing the gas and burning it to generate electricity.

Chicopee's $3.9 million methane gas electricity producing project began operation on July 24, 1993. Chicopee's partners in this public/private joint venture are Alternative Power Limited Partnership (APLP) of Houston, Texas, and Browning Ferris Industries (BFI) and Browning Ferris Gas Services, Inc. (BFGSI), both of Chicopee, MA. Under the terms of the agreement, APLP collects the methane gas from the landfill, cleans it, dries it and pipes it to an electricity generating plant operated by BFGSI. The Chicopee Municipal Lighting Plant then purchases the electricity.

In its first year, the plant's capacity was 2.4 megawatts and the total energy delivered was 9,150,853 kW hours. In 1994, the capacity increased to 2.9 megawatts with more than 21 million kW hours of electricity generated. This is enough electricity to power 2,400 average homes in Chicopee each year.

The electricity produced at the methane gas plant saves the Chicopee Municipal Lighting Plant $128,762 annually, compared to the cost of generating electricity using a traditional fossil fuel. CMLP also realizes savings because they eliminate the typical line losses that occur from transmitting energy long distances. Given these savings, CMLP will get their project investment back in just 7 years.

Other project partners are also saving. Before implementing the project, BFGSI ran gas blowers to "flare" or burn the methane gas generated by the landfill. The "flaring" prevented the gas from entering the atmosphere or migrating to another site. Because they now use the gas to generate electricity, BFGSI saves $12,000 annually by not running the gas blowers.

In addition to generating electricity, saving money and protecting the environment, the Chicopee Landfill project eliminates landfill odors, creates new jobs and provides demonstration and educational opportunities for other communities. For all of these benefits, Chicopee's trash is also its treasure.

For more information, contact Nils Bolgen, Dispersed Generation Program Manager, at (617) 727-4732 ext. 178.

MORE THAN $890,000 FOR CONSERVATION AWARDED TO SCHOOLS AND HOSPITALS

Twenty-seven schools, school districts and hospitals in Massachusetts received grants totaling $891,945 for technical assistance and energy conservation measures, during Cycle 17 of the federally funded Institutional Conservation Program (ICP).

At DOER's recommendation, the U.S. Department of Energy (DOE) awarded these grants to increase energy efficiency and reduce operating costs in 41 buildings throughout the Bay State.

The Institutional Conservation Program provides matching grants to public and nonprofit schools and hospitals. The grants fund energy audits and the purchase and installation of cost-effective energy efficiency measures. Measures include new lighting systems, heating and ventilation improvements, computerized energy controls and insulation. ICP funds between 50% and 90% of the cost of recommended conservation measures.

Program requirements and funding levels for the Institutional Conservation Program currently are undergoing significant change at the federal level. The Division of Energy Resources is working with DOE to adapt the Massachusetts program to these changes. DOER plans to continue to offer energy efficiency assistance to schools and hospitals in the next program year.

For more information about the Institutional Conservation Program, contact Laura Merrill, Program Manager, at (617) 727-4732 ext. 146.

SWEETHEART: From page 1

will save Sweetheart $87,000 in annual energy costs at the Somerville plant alone. Sweetheart determined that they could use this same technology at other facilities. "We are taking the analyses done by the Massachusetts Energy Advisor Service and are applying it to our facilities nationwide," stated Bush. He added, "The service tripped our thinking and started us asking: 'Where else can we apply this same technology?'"

When implemented, the total improvement package could save Sweetheart Cup $470,000 in annual energy costs on an investment of $836,000. That's a pay back of less than two years.

Commissioner David O'Connor said, "Sweetheart Cup provided our team with an ideal setting, informed and knowledgeable management, and committed employees, all of which made our Energy Advisor Service efforts there a success." O'Connor continued, "Sweetheart Cup demonstrates how business and government can work cooperatively on highly technical issues and produce positive results."

The Energy Advisor Service is funded through federal oil overcharge dollars. On average, EAS customers pay only 12% of the cost of EAS services, or as little as $100 per day. Over the past ten years, the Energy Advisor Service has worked with more than 550 Massachusetts companies and identified over $70 million in energy efficiency savings.

By using and implementing EAS services and recommendations, Massachusetts industries are cutting costs, increasing energy efficiency, spurring economic competitiveness, and protecting the environment.

To inquire about the Energy Advisor Service, please contact EAS Program Manager Cliff Sullivan at (617) 727-4732 ext. 160.

DEP APPROVES PERMIT EXEMPTION FOR FUEL CELLS

STATE

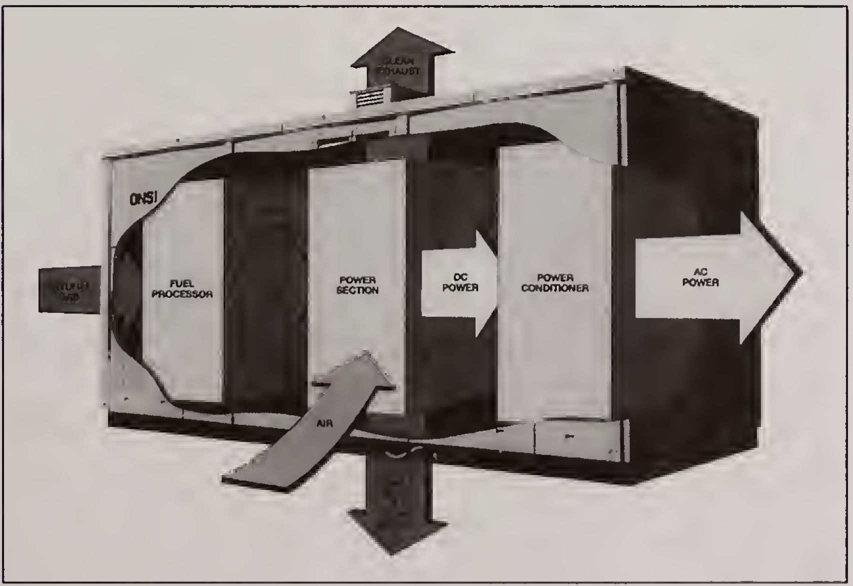
The Massachusetts Department of Environmental Protection recently exempted fuel cells from permitting requirements under its Air Pollution Control Regulations. The Secretary of State certified and published the exemption on November 3, 1995. Because emissions from fuel cells are well below current air pollution thresholds, DOER and the Fuel Cell Working Group (see *Energy Report*, Winter 94/95), recommended the exemption to cut down on unnecessary regulations.

DOER believes that removing the air quality regulation barrier will support the growth of the fuel cell industry in Massachusetts. Without permitting, the costs associated with fuel cell installation should decrease, thereby making them a more viable alternative for electric generation. Currently, six Massachusetts companies perform research, development and installation activities in fuel cell production.

Fuel cells generate high quality electricity in an extremely clean and efficient manner. They produce electricity through a chemical process like batteries, but rely on a continuous supply of fuel such as natural gas or hydrogen. Due to their operational reliability, modular nature and low noise factor, fuel cells have excellent potential for on-site and dispersed generation applications.

The Fuel Cell Working Group, organized by DOER in November 1994, includes representatives from Massachusetts state agencies, environmental organizations, electric and gas utilities, and the fuel cell industry.

For more information contact, Nils Bolgen, DOER Dispersed Generation Program Manager, at (617) 727-4732 ext. 178.



System design of the ONSI PC25 C Fuel Cell Power Plant, a complete, self-contained energy generator.

WINTER/SPRING 1996

MARCH

11 *CONEG Toxics in Packaging Cleaninghouse Meeting*, Newark, NJ. Call (202) 624-8450 for more information.

12 *CONEG Source Reduction Task Force Meeting*, Newark, NJ. Call (202) 624-8450 for more information.

14 *Building Integrated Photovoltaic Design*, Cambridge, MA. Sponsored by Boston Area Solar Energy Association. Call (617) 49 SOLAR.

16-17 *"Faith In A Seed" New England Environmental Conference*, Medford, MA. Sponsored by the Environmental Network. For more information call (617) 627-3162.

17-22 *Affordable Comfort '96 - The Innovative Edge of Housing Performance*. Call (412) 299-1136 for more information.

27-29 *1996 EPRI Conference on Innovative Approaches to Electricity Pricing*, LaJolla, CA. Contact Lori Adams at (415) 855-8763.

31-April 3 *17th Biennial Waste Processing Conference & Exhibit* and *NAWTEC-IV: North American Waste-to-Energy Conference*. Atlantic City, NJ. (800) 627-8913.

APRIL

10-12 *Energy Savings Performance Contracting* training seminar, New York, NY. Sponsored by FEMP. Contact Lisa Frey, (202) 737-1911.

13-19 *Solar '96* Asheville, NC Sponsored by the American Solar Energy Society, 303-443-3130.

MAY

10-17 NESEA's *8th Annual American Tour del Sol*. Road rally championship for electric, hybrid electric and solar assisted vehicles. New York City to Washington, DC. Call (413) 774-6051 for more information.

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ENERGY REPORT

A PUBLICATION OF THE MASSACHUSETTS DIVISION OF ENERGY RESOURCES

Vol.4/No.2
Summer 1996

The Commonwealth of Massachusetts

William F. Weld,
Governor

Argeo Paul Cellucci,
Lt Governor

David Tibbetts,
Director
Economic Development

David L. O'Connor,
Commissioner
Energy Resources

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MA Electric Industry Restructuring Progresses

STATE

Exciting developments are transpiring as the framework for Massachusetts' transition to a restructured electric industry is beginning to take shape. Establishment of a renewable energy fund, through a general access charge, to promote the further development and marketing of renewable energy technologies (solar, wind, hydro power) is one of the draft rules issued by the Department of Public Utilities (DPU) on May 1. *(Editor's Note: DPU Order 96-100 can be accessed through the DPU Web site at http://www.magnet.state.ma.us/dpu/)*

Other major issues addressed in the 100-page order are:

- Design and implementation of a price cap mechanism for distribution companies, which will enable a conversion from cost-of-service ratemaking to an incentive form of performance-based regulation.
- Continuation of low income discounts through a special tariff that would enable distribution companies to provide "Universal Service" to qualifying low-income customers.
- Obligation of distribution companies to provide "Basic Service" for customers who cannot or do not obtain generation services from an outside supplier.
- Registration requirements for entities seeking to sell electricity to retail customers either through direct contact or aggregation.
- Continued funding of energy efficiency services by distribution companies until such time that said services are offered in a competitive marketplace.
- Identification, calculation and mechanisms for the recovery of stranded costs by investor-owned electric utilities, including mitigation of embedded costs and incentives for divestiture.

As part of Order 96-100, the DPU also made provisions for interested parties to participate in the process via written comments, open hearings and public meetings. DOER, a strong proponent of restructuring, filed a document with the DPU on May 24th that included

RESTRUCTURING: Continued on page 6.

CHARGING INTO THE FUTURE

STATE

The latest advancements in electric vehicle technology will soon be traveling on Massachusetts roadways as final arrangements are made for Phase II of the Electric Vehicle Demonstration Program. Requests for Proposals for 16 new electric vehicles were recently released with the expectation that the new cars will be on the road this fall.

The largest project of its kind in the United States, the EV Demonstration Program illustrates the congestion mitigation and air quality benefits offered by electric vehicles when incorporated into the transportation mix.

According to DOER Director of Programs Jack Bevelaqua, Phase II will demonstrate the viability of the latest battery technology. "Tremendous advancements have been made since our first EV purchase in 1994," he noted. "The biggest benefits to come from this new technology are greater range and shorter recharging times."

The cars used in the program to date have a minimum range requirement of 30 miles and operate with either sealed lead acid or nickle cadmium batteries. In Phase II of the program, the cars will have longer range capacities. Six will be equipped with nickle metal

EV PHASE II: Continued on page 2.

FROM COMMISSIONER O'CONNOR:

Summer is here, bringing with it the pleasures of the season warm sun, vacations, beaches, hiking, biking But there is also a negative side to our sometimes hot and humid New England weather -- poor air quality

We've all watched the news and heard health officials recommend that children, the elderly, and those with respiratory difficulties stay inside to avoid the high levels of ozone and air pollution. Those in good health are also told to limit their activity. However, if you look out your windows on those days, you'll see people continue to exercise, go to their children's baseball and soccer games, and do yard work, without giving a thought to the quality of the air they are breathing, or even how it came to be polluted.

According to a recently published study by the Natural Resources Defense Council, 64,000 Americans die each year from the harmful effects of fine particles of air pollution released by power plants, motor vehicles and other sources -- 1,136 die in Massachusetts alone.

Air pollution is also a primary factor in the rise of asthma among children and adults. Between 1990 and 1993, Massachusetts saw a 14% increase in asthma-related hospitalization of children and adolescents, and an 11% increase in adult admissions.

Our reliable electricity supply and vast options for convenient travel add value to everyday living. But we must bear in mind that our daily actions and decisions greatly affect the quality of the air that we breathe. These decisions include the transportation we use, the purchases we make and the businesses we operate.

According to the Department of Environmental Protection, on an average summer day in Massachusetts, vehicles and industries release 1,700 tons of volatile organic compounds, 956 tons of nitrogen oxides and 3,700 tons of carbon monoxide into the atmosphere. These pollutants cost residents, businesses and industry millions of dollars a year in higher medical costs, lost wages and decreased productivity.

The Division of Energy Resources looks for new and better ways to address Massachusetts' energy needs. Our mission is to find methods that are consistent with economic revitalization, environmental improvement, greater use of energy efficient transportation and increased energy education. Toward that end, this edition of the *Energy Report* focuses on activities in our transportation and renewables programs that help reduce pollution.

In this issue, you'll read about our successes in putting zero- and low-emission vehicles on the road and work to develop a fueling infrastructure to support them. Director of the Department of Economic Development, David Tibbetts shares his thoughts about the environmental and economic benefits of renewable energy in Massachusetts. And, we offer a list of ways that you can make a difference by lowering the emissions from your own vehicle.

Communities, businesses and individuals can make environmentally sound and economically efficient energy decisions. Through energy conservation, alternative energy and energy policy programs, DOER makes these decisions easier. With continued education and responsible action, we can decrease use of high emission energy sources and improve our quality of life. And, we can improve the lives of generations to come.

EV PHASE II: Continued from page 1.

hydride batteries with a range of 100 miles on a single charge. Five vehicles will use advanced lead acid batteries with a minimum range of 90 miles. The remaining five cars will use improved lead acid batteries with a minimum range of 60 miles.

With the addition of these new cars, more people will be able to participate in the demonstration program. "We're excited about the advanced technology and the opportunity to expand our base of drivers," said DOER's Transportation Program Manager David Rand. "Our drivers are actually EV Ambassadors. They lend credibility and help spread the good word about these clean, environmentally sound cars," he added. Drivers are selected for the demonstration program based on criteria including past driving history and distance traveled during their daily commute.

During Phase II, DOER will gather data on vehicle operation from computerized collection systems and monthly driver surveys. The onboard collection systems will download data directly into the electric vehicle National Data Center computer. This information enables DOER to evaluate the electric cars' performance in varying conditions and to compare performance with gas-powered engines. The results will be shared with manufacturers, researchers and others who are working to create an electric car that meets all drivers' needs.

DOER's Electric Vehicle Demonstration Project partners include the Massachusetts Highway Department, Boston Edison, New England Power, Commonwealth Electric/Cambridge Electric Light Department, Northeast States for Coordinated Air Use Management, the Metropolitan Area Planning Council, the Massachusetts Department of Environmental Protection, the Massachusetts Department of Procurement and General Services, the Northeast Alternative Vehicle Consortium and the Massachusetts Bay Transportation Authority.

For more information on the Electric Vehicle Demonstration Program, contact David Rand, Transportation Program Manager at (617) 727-4732, ext. 138 or e-mail him at Drand@state.ma.us.

DOER ASSISTS MASSACHUSETTS' LARGEST CROP GROWERS

STATE

The recent surge in the popularity of cranberries is not solely attributable to great marketing. The use of cranberries has multiplied over the past few years to include everything from muffins to mixed drinks. This expansion however, would have not been made possible unless growers maximized production while reducing costs.

Massachusetts has long held the crown as the world's top producer of cranberries. But the recognition is far outweighed by the economic impact of cranberries on the Commonwealth.

The growth, harvesting and production of cranberries in Massachusetts is a $98 million business, employing more than 5500 persons. To help the growers in this important Massachusetts industry maximize energy efficiency and reduce costs, DOER and the Massachusetts Department of Food and Agriculture undertook a two-year irrigation management pilot study. The study examined the three components required to efficiently provide supplemental water for crop needs: fuel efficient pumping, uniform distribution of water to the crop and proper irrigation scheduling.

A research team from Pilgrim Resource Conservation and Development Area Council, under contract with DOER and assisted by the USDA Natural Resources Conservation Service, tested the irrigation systems of 11 Massachusetts cranberry growers.

The research team determined that energy efficiency and uniformity could be improved in many of the pumping systems that they analyzed. Some of the savings are possible through easy options such as operating the systems at higher pressures. Other, more complicated measures include replacing pumping plant components to meet system requirements and replacing entire older, deteriorated systems.

In another effort to reduce water and energy consumption, the researchers assessed the applicability, feasibility and usefulness of some common and experimental irrigation scheduling tools. "Over-irrigation can waste a grower's time, money, and water. Too much water can result in increased susceptibility to crop disease as well as leaching of nutrients and other chemicals," said Henry Kunhardt,

CRANBERRIES: Continued on page 5.

VEHICLE EMISSIONS: The Problem and Some Solutions

Since the early 1800s, the amount of carbon dioxide (CO2) - a known greenhouse gas - in the earth's atmosphere has increased 25% worldwide. In the United States, the transportation sector alone produces 32% of CO2 emissions and will be the fastest growing source of carbon dioxide emissions through the year 2000.

Motor vehicles also emit other air polluting gases such as nitrogen oxides, hydrocarbons and carbon monoxide. In Massachusetts alone, there are over six million registered motor vehicles - about one for each man, woman and child who lives here. These vehicles spew 36% of the hydrocarbons, 46.5% of the nitrogen oxides and 72.6% of carbon monoxide found in our air.

For more than two decades, air quality in Massachusetts has failed to meet the standards prescribed by the Clean Air Act. The EPA suggests it will be even harder for states to meet air quality standards because Americans are increasing auto emissions by driving heavier cars and trucks at faster speeds.

What can you do to help? By following these tips you can reduce your vehicle's energy consumption, lower emissions and contribute to a cleaner environment:

Driving Habits:

- Turn the engine off rather than letting it idle - particularly if you won't resume motion for more than one minute.
- Travel at reduced highway speeds. Traveling at 55 mph instead of 65 mph reduces fuel consumption 15%.
- Combine errands into one trip. Starting a cold car engine for short trips, whether in winter or summer, can double fuel consumption.
- Minimize the use of air conditioning. The air conditioner increases fuel use by up to 12% in stop-and-go traffic and 4% at highway speeds.
- Carpool to work or use public transportation.
- Walk or bike to the corner store - you'll enjoy the exercise!

Maintenance

- Get tune-ups regularly, according to your vehicle's specifications.
- Keep tires inflated to the manufacturer's recommended maximum pressure. Improper tire inflation wastes 5% more gas. The front wheels should also be kept in alignment in order to avoid using excess fuel.
- Remove snow tires in the spring. Snow tires increase fuel consumption up to 4%.
- Replace the oil every three months or 3,000 miles with a premium, multi-grade oil and improve your car's fuel economy by up to 6%.
- Keep gas and air filters clean. A clogged filter wastes gasoline and reduces engine performance.
- Remove roof racks and storage bins when not in use. Do not carry any unnecessary weight. Additional weight and wind resistance increases gas consumption.

Purchasing Considerations

- Buy a lighter, smaller, fuel efficient car or an alternative fuel vehicle (compressed natural gas, electric, etc.).
- Forego gas guzzling options such as a high performance engine, turbocharged V8 engine, 4-barrel carburetor on a V8 engine, and four wheel drive.

Sources: US Department of Energy - National Renewable Energy Laboratory and Environment Canada.

The Economics of Renewable Energy in Massachusetts

by David Tibbetts, Director, Department of Economic Development

By the end of 1990, the Massachusetts economic situation reflected the harsh reality of an economic crisis, including major layoffs in the mini-computer and defense-related industries, which had enjoyed years of sustained growth. The banking industry was overextended as real estate values collapsed. Massachusetts' bond rating plummeted to the lowest level in the country and the state faced an almost billion dollar deficit in its operating budget. To make matters worse, Massachusetts was widely considered to be a bad place to do business, with high taxes, high business costs, cumbersome regulations, and an unfriendly attitude.

In the past five years, the picture has changed dramatically . . . for the better. The Weld-Cellucci Administration, with bipartisan cooperation from the State Legislature, has restored fiscal stability, lowered taxes and created a vibrant, new business climate. Together, we've worked to change the unfavorable perception of operating a business in Massachusetts. Reducing the costs of doing business was the immediate first step toward changing that perception, and it remains an ongoing economic development strategy for the Commonwealth.

As part of that strategy, we are now working with utilities, industry representatives, consumer advocates and others to lower the high cost of energy in Massachusetts. We hope to ease this burden through the deregulation of both the electric and natural gas industries that will open these markets to competition and consumer choice. But retail price is only part of the energy picture. An attractive business climate also gets its strength from a foundation of environmental and economic security.

We currently depend too much on costly, imported oil and other fossil fuels for much of our electric power generation. Over-reliance on fossil fuels drives up energy costs and subjects consumers to the vagaries of world oil markets. Continued use of fossil fuels also has a high environmental cost. Fossil fuel combustion is responsible for over 60% of all sulfur dioxide emissions and over 20% of all nitrogen oxide emissions in Massachusetts. For more than two decades, air quality in Massachusetts has failed to meet the standards prescribed by the Clean Air Act. As a result, Massachusetts has been designated as being in "serious non-attainment" of ground level ozone standards on a statewide basis.

Our energy habits can become more economically and environmentally responsible through a multi-faceted strategy. One important facet of that strategy includes the development of renewable energy technologies and fuel cells.

Emission-free, renewable technologies such as solar, wind and hydro power, facilitate compliance with current environmental regulations while providing a sustainable source of energy production.

The Department of Economic Development and the Division of Energy Resources work closely with consumers and businesses to promote and demonstrate the viable application of renewable energy sources. A joint, state and privately funded wind project is currently generating electricity for the Mount Tom Ski Area. The turbine is owned and operated by the University of Massachusetts at Amherst and is also used as a research project for students.

Another example of the use of renewables is the 3.2 kW photovoltaic power station located on Peddocks Island in Boston Harbor. This solar system, with battery storage and diesel generation back-up, uses the sun to power the lighting, communications and safety equipment in five buildings on the island.

The Department of Public Utilities (DPU) also recognizes the importance of renewable energy supplies. In its recently issued Electric Restructuring Draft Rules, the DPU proposes to create a renewable technology development fund *(Ed. note: For more details see Restructuring Story p. 1).* Renewable technologies also provide a form of insurance for investors and consumers against future, potentially more stringent, air quality regulations.

Fuel cells are another exciting, clean electric technology. These small, packaged units operate very quietly and provide grid-compatible and uninterruptible AC power. Fuel cells are valuable generation alternatives for businesses, such as banks and high tech companies, that need precise power quality control to operate computer systems and other sensitive equipment. Fuel cells are also viable power supply alternatives for hospitals, airports, and prisons for which interruptions in service, or power failures, can result in life-threatening situations.

Most fuel cells operate on natural gas and produce only a small fraction of the emissions of a comparably sized conventional generating unit. In fact, emissions are so low that fuel cells are now exempt from Massachusetts air quality permitting requirements. We hope the removal of this barrier will ease the siting process and increase installations of this clean technology throughout Massachusetts.

Ease of siting is another benefit of both renewables and fuels cells. Photovoltaic (PV)

TIBBETTS: Continued next page.

TIBBETTS: Continued from page 4.

systems, which convert sunlight into energy, can be easily incorporated onto existing rooftops and will soon be available for installation directly into wall and roofing materials. Additionally, areas experiencing increased demand for power can be served by adding a fuel cell or renewable energy generating unit nearby. Application of these "dispersed generation" technologies can defer, and in some cases eliminate, costly and lengthy electric utility distribution system upgrades.

Industries supporting the research and development of renewables and fuel cells are growing at a rapid pace. PV panel production in the United States has more than doubled in the last five years. Worldwide, 1995 installed wind generating capacity grew by 35%.

Massachusetts, with our leading technological, educational and economic resources, is committed to supporting the development and growth of these industries which employ over 250 people in 11 companies statewide. Recently, ASE Americas, Inc. of Billerica , a growing manufacturer of photovoltaic modules, determined that it needed to quadruple its operations over the next three to five years. By working with the state and local governments, they received "Certified Project" designation under the Massachusetts Economic Development Incentive Program. This resulted in ASE Americas receiving a 5% Investment Tax Credit on the company's state income tax liability and a local municipal real estate tax incentive.

The benefits of offering these incentives to ASE Americas include the retention of 81 jobs and the creation of 70 new positions, preferred hiring for qualified Billerica residents and the instruction and training in PV technology to Billerica High School and Shawsheen Technical School students.

Two groups have been formed to promote the use and development of renewable technologies and fuel cells. The Massachusetts Photovoltaics for Utilities Working Group (PV4U) has been successful in bringing federal funds into Massachusetts for pilot projects. Comprised of utilities, state agencies, businesses and other interested parties, PV4U promotes constructive discussion among stakeholders regarding the potential of photovoltaics.

The Massachusetts Fuel Cell Working Group was formed in 1994 by the Division of Energy Resources. This group of representatives from government agencies, environmental groups, utilities and the fuel cell industry was responsible for obtaining the air quality permit exemption for fuel cells.

The work of these two organizations, coupled with advancements in the energy industry, herald exciting opportunities for the growth and development of renewable energy and fuel cells. This growth promises great benefits for Massachusetts in the form of jobs, economic security and a cleaner environment.

For more information on fuel cells or renewable energy contact Nils Bolgen, Renewables Program Manager at (617) 727-4732, ext. 178 or e-mail him at Nbolgen@state.ma.us. For further information on Massachusetts' economic development incentives, please call 1-800-5-CAPITAL.

CRANBERRIES: Continued from page 3.

project engineer. "Under-irrigation," he added, "increases crop stress and can result in decreased crop quality and quantity."

Researchers were encouraged by the performance of some of the experimental measuring devices and are planning further tests to determine their long term viability.

At the conclusion of the studies, detailed reports that outlined specific measures to improve energy and water efficiency were given to each grower. DOER also sponsored conferences that brought the growers and researchers together to share ideas and compare and contrast the auditing results.

As a result of these tests, Massachusetts cranberry growers can run more efficient irrigation systems that optimize water and energy, as well as increase crop quality and production.

For more information on the Irrigation Management Study or copies of study monographs, contact Laura Merrill, Program Manager at (617) 727-4732, ext. 146 or e-mail her at Lmerrill@state.ma.us.

PROOF POSITIVE: SOLAR WORKS

Smith Academy, a junior/senior high school in Hatfield, can attest to the claim that solar panels save money. Back in 1981, DOER awarded an $85,000 grant, through the Alternative Energy Property Program, to the Town of Hatfield for the installation of a solar assisted heat pump system at Smith Academy.

Sixty solar panels located on the roof of the school heat water that is used by the heat pump system. The heat pumps extract the heat from the water and deliver it to the building in the form of forced hot air. The system also "stores" surplus solar heat in an insulated sand bed for use in the winter.

In October 1994, a non-system related fire damaged the control unit of the solar system. While the insurance claim was being processed, school officials were forced to rely on an electric resistance heating system to heat the school. While the electric system was effective in generating heat, it also generated a $25,000 increase in annual energy costs. "When the solar system went down our electric demand jumped so much that the utility replaced the meter because they thought it was providing inaccurate readings," said Mark Vachula, chairman of the maintenance sub-committee of the Hatfield School Board. "Truth of the matter is, the meter was reading correctly -- the demand just skyrocketed without the solar system."

The solar system was repaired this spring and has been operating smoothly since. "This experience, though costly," said Vachula, "proves the point that solar energy is not a fantasy, it actually saves money!"

For more information on solar heating systems, contact Nils Bolgen, Renewables Program Manager at (617) 727-4732, ext. 178 or e-mail him at Nbolgen@state.ma.us.

BECO SETTLEMENT BOARD REPORTS

By: Susan E. Coakley, Technical Director,
Boston Edison Settlement Board

Since 1990, Boston Edison customers have been getting a lot more from their utility than just electricity. In a settlement agreement following a two year outage at the Pilgrim nuclear power plant in 1987 and 1988, Boston Edison (BECo) established a $75 million fund for the research and implementation of demand-side management (DSM) programs which promote energy efficiency and reduce consumption. The settlement and funds were managed by the parties to the agreement: BECo, the Division of Energy Resources (DOER), the Massachusetts Attorney General's Office, and MASSPIRG, with the assistance of the Conservation Law Foundation.

From 1990 to 1992, the BECo-sponsored energy efficiency and consumption management programs provided over 120 megawatts (MW) in electrical load reduction, which is equivalent to the total peak generating capacity of the four units at BECo's Kendall Street station. The energy efficiency efforts provided both money and energy savings for BECo's residential, commercial and industrial customers, while delaying the need to build a costly new power plant. From 1992 to 1994, BECo included aggressive implementation of demand-side management programs in its annual budgets.

After the majority of the settlement funds had been spent on successful DSM programs, the Settlement Board funded a series of research projects that analyzed new and evolving energy efficiency program strategies, and the economic and environmental value of energy efficiency and dispersed renewable energy resources for the Boston Edison service area. Additionally, the Settlement Board sponsored workshops and research papers on the roles of energy efficiency and dispersed generation in deferring the expansion of electric utility transmission and distribution systems.

Among the findings from the research projects were:

- Energy efficiency investments made by Massachusetts utilities between 1990 and 1993 deferred the need for over 270 MW of new electric power supplies and effectively reduced the emission of nitrogen oxides, sulphur dioxide and carbon dioxide into the air by approximately 3%.
- Dispersed renewable energy technologies (including photovoltaics, wind, solar hot water and biomass) can provide up to 31% of Boston Edison customers' annual energy needs.
- Current air pollution standards are not adequate to protect human health and natural ecosystems. Increasing the role of energy efficiency and the use of clean and renewable energy resources in New England's electric power system, while also retiring high emission, fossil-fueled power plants, are key elements in improving air quality.

To stimulate the growth of the Massachusetts photovoltaic industry, the Settlement Board developed three market-based program designs for utility implementation. They include existing homes, new residential construction and areas where transmission and distribution upgrades can be deferred.

Based on its research findings, the Settlement Board spearheaded a multi-party formal recommendation of upgrades and improvements to the energy-related portions of the Commonwealth's residential building codes. They suggested the development of a multi-state project to upgrade the energy provisions of commercial building codes. The Settlement Board also developed market transformation strategies to increase energy efficiency in residential water heating and lighting fixtures, commercial lighting systems, and rooftop air conditioners.

A complete list of the Settlement Board's research reports and workshop proceedings will be available this summer on DOER's Internet Web site at: http://www.magnet.state.ma.us/doer/.

For additional information, contact Susan Coakley at (617) 860-9177 or through electronic mail at CoakleyS@aol.com.

ELECTRIC RESTRUCTURING: Continued from page 1.

specific comments on issues addressed in Order 96-100, responses to questions outlined by the DPU in the Order, alternative proposed regulations, and supporting testimony, exhibits and materials. *(Editor's Note: These comments and responses are available through DOER's Web site at http://www.magnet.state.ma.us/doer/)*

Open hearings will continue to take place through mid-July with public meetings scheduled for Boston, Pittsfield, Fitchburg, Plymouth and Salem. *(See below)* The DPU is expected to issue final electric industry restructuring regulations in early October.

For more information on electricity issues, contact DOER Director of Policy Fran Cummings or Vicki Pitluk, Director of Public Information, at 617-727-4732.

ELECTRIC RESTRUCTURING PUBLIC MEETINGS

July 10 - Boston
7:00 p.m.
Gardner Auditorium
State House

July 16 - Pittsfield
7:00 p.m.
Koussevitzky Center
West Street, Room 111

July 18 - Fitchburg
7:00 p.m.
Fitchburg Public Library
610 Main Street

July 29 - Plymouth
7:00 p.m.
Plymouth Public Library
132 South Street

July 30 - Salem
7:00 p.m.
City Hall - City Council Chamber
93 Washington Street

For more information, contact the Department of Public Utilities at (617) 727-3500.

GAS COMPANIES "UNBUNDLE" SERVICES

INDUSTRY

Bay State Gas Company has submitted to the DPU a plan for the implementation of an "unbundled," residential gas services pilot in its Springfield service area. The pilot was approved by the DPU as part of a settlement with DOER and other parties in the Bay State Gas Transportation Rate Redesign case (*Energy Report*, Winter 1996).

Under the proposal, up to 10,000 residential customers could sign up, on a first-come, first-served basis, for the opportunity to choose their gas supplier. To date, more than 15 gas marketers and suppliers have expressed interest in serving this new market.

It is anticipated that the pilot program will lay a successful framework for future statewide unbundling while helping the DPU identify any problems or situations that might act as a barrier to the process.

On May 17th, Boston Gas filed a plan with the DPU to separate its gas sales services from delivery. Over the next few years, the company proposes to stop selling gas to its consumers while continuing to provide transportation and delivery of gas.

Under the proposal, Boston Gas customers would be required to pick a gas supplier of their choice. The program would begin as early as this November for commercial and industrial buyers and expand to residential customers in November 1997. Boston Gas would eventually cease selling gas. In the future, the company proposes to provide only local delivery, transportation and maintenance services. The rates for these services, which would continue to be regulated, would be set under a new, performance-based standard.

Typically, utilities have filed what is known as cost-of-service rates. Using this ratemaking formula, utilities were allowed to recoup all expenses with a predetermined margin of profit. Performance-based regulation, on the other hand, is an incentive system that sets prices on a utility's ability to improve productivity and reduce costs without impacting service and reliability.

Questions regarding gas issues should be directed to Joanne McBrien, Senior Policy Analyst, or Vicki Pitluk, Director of Public Information at (617) 727-4732.

CNG BILL GETS GREEN LIGHT

STATE

Governor William F. Weld signed a bill into law that will stimulate the use and development of "clean," alternative fuel vehicles. Filed by Representative Albert Herren (D-Fall River), H.3334 amends Massachusetts General Laws Chapter 164 to deregulate the sale of compressed natural gas (CNG) as a motor vehicle fuel.

"This is a breakthrough for the alternative fuels market. Now CNG may be sold by any gasoline retailer who wishes to do so," said Representative Herren. "This bill is a benefit to the Commonwealth both environmentally and economically. I'm thrilled that it has been signed into law," he added.

Natural gas, commonly used for heating, cooking and generating electricity, is also an efficient and clean motor vehicle fuel. The United States Environmental Protection Agency classifies cars and trucks running on CNG as "low-emission" vehicles.

Supporters of this law anticipate a surge in the development of fueling stations for natural gas vehicles by the private sector. While CNG stations operate in the same way as gasoline service stations, they do not require the siting of costly and potentially dangerous underground storage tanks.

Prior to the passage of H.3334, any business selling natural gas was subject to regulation as a utility by the Department of Public Utilities. This regulation was viewed as a deterrent to the development of CNG fueling stations. And, without fueling facilities, there was little to encourage the development, purchase and use of CNG vehicles.

CNG BILL: Continued on page 8.

MASSACHUSETTS RECEIVES NATIONAL ENERGY AWARD

STATE

The Massachusetts Division of Energy Resources (DOER) and the Massachusetts Office of Technical Assistance (OTA) were presented the National Industrial Competitiveness through Energy, Environment and Economics (NICE^3) Communications and Management Award. Dan Sardo, Manager of the NICE^3 Program at DOER, accepted the award at a national ceremony held in Washington, D.C.

Sponsored by the U.S. Department of Energy's Office of Technologies, the award recognizes the high quality and number of proposals submitted for NICE^3 funding since the program's founding in 1992. Michigan, Ohio and Pennsylvania were also honored.

NICE^3 provides one-time grants to help offset start-up risks for innovative technology demonstration projects that significantly conserve energy and energy-intensive feedstocks, reduce industrial waste, prevent pollution and improve industrial cost-competitiveness. The grants, which are provided by the U.S. Department of Energy and Environmental Protection Agency, award up to $425,000 and require a cost-share of at least 50% of the total project. After the initial funding, the awardee is expected to commercialize the process or technology.

The Massachusetts NICE^3 program is a multi-agency effort that includes DOER, OTA, the Executive Office of Environmental Affairs, Massachusetts Office of Business Development and the Industrial Services Program.

For more information on NICE^3 contact Dan Sardo, DOER Program Manager, at (617) 727-4732, ext. 130 or e-mail him at Dsardo@state.ma.us.

DOER WEBSITE ON-LINE

Public information efforts at the Division of Energy Resources (DOER) have expanded with our new Web site on the Commonwealth of Massachusetts' home page. Since its inauguration in March, the site has listed Requests for Proposals, news releases, and recently published studies. One of the most popular documents accessed, and frequently downloaded, is DOER's generic plan and filing with the Department of Public Utilities on electric utility restructuring.

Future plans call for postings of other DOER filings and legislation, information on DOER program and policy initiatives, and fuel price surveys. Links to other energy information sources on the Internet will also be provided.

Please visit our WWW site at http://www.magnet.ma.us./doer/. Suggestions for other offerings can be e-mailed to energy@state.ma.us.

CNG BILL: Continued from page 7.

"This breaks through a frustrating log jam," noted Division of Energy Resources (DOER) Commissioner David O'Connor. "Without the development of a supporting infrastructure, little progress could be made in the promotion of CNG vehicles. We have aggressively pushed for this type of legislation.

"Increased use of CNG vehicles will improve the Commonwealth's fuel diversity, reduce air pollution, promote growth in related industries and decrease our reliance on imported oil," he added.

Other agencies supporting H.3334 included the Department of Economic Development, the Executive Office of Environmental Affairs, and the Department of Public Utilities, as well as environmental advocates, gas utilities and businesses involved in dispensing compressed natural gas.

For more information on compressed natural gas vehicles, contact David Rand, Transportation Program Manager, at (617) 727-4732, ext. 138 or e-mail him at Drand@state.ma.us.

SUMMER 1996 CALENDAR

JULY

15 - 19 Renewable Energy and Environmental Education - The 1996 Summer Institute for Teachers, Beverly, MA. Sponsored by Solar Now. For more information call (508) 927-9786.

AUGUST

4 - 7 Fourth Biennial Meeting of the International Society for Ecological Economics (ISEE), Boston, MA. Sponsored by ISEE. For more information e-mail a message to isee96@bu.edu or call (617) 353-7511.

SEPTEMBER

12 Massachusetts Landfill Gas Roundtable, Boston, MA. Sponsored by the MA Division of Energy Resources and the MA Department of Environmental Protection. For more information call Irving Sacks at (617) 727-4732.

16 - 18 Sustainable Transportation & Solar/EV Symposium '96, New York, NY. Sponsored by the Northeast Sustainable Energy Association. For more information call (413) 774-6051.

The *Energy Report* is published by The Massachusetts Division of Energy Resources.

Suggestions, calendar submissions, questions and input are invited. Send to Editor, *Energy Report*, The Massachusetts Division of Energy Resources, 100 Cambridge Street, Room 1500, Boston, MA 02202. DOER staff members can be contacted at (617) 727-4732. *Energy Report* is printed on recycled paper using soy ink.

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ENERGYREPORT

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The Commonwealth of Massachusetts

William F. Weld, Governor

Argeo Paul Cellucci, Lt. Governor

David Tibbetts, Director
Economic Development

David L. O'Connor, Commissioner
Energy Resources

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NEES to Sell Power Plants in Settlement With DOER

On October 2, New England Electric System (NEES), the parent company of Massachusetts Electric Company and New England Power Company, filed a settlement plan with the MA Department of Public Utilities (DPU) in which the company agreed to divest its generating business. As such, NEES has committed to sell all or most of its generation assets to new owners within six months of the advent of retail choice in the Commonwealth. The Division of Energy Resources (DOER) joined in the settlement along with the Office of the Attorney General, the Conservation Law Foundation, the Northeast Energy Efficiency Council, the Energy Consortium and independent power producers, among others.

According to DOER Commissioner David O'Connor, "This settlement aggressively addresses consumers' needs for rate relief, choice and protection while ensuring that the resulting electric industry is reliable, competitive and efficient. We hope that similar agreements can be made with other utilities to ensure a smooth transition to deregulation in 1998."

The concept of voluntary utility divestiture of power plants was first introduced to the restructuring debate when DOER submitted a generic plan for restructuring to the DPU in February. DOER became the leading advocate of divestiture to ensure the success of electric utility restructuring. Full divestiture removes any concerns about the abuse of market power and establishes the correct relationship between what will be the regulated distribution companies and the unregulated generators. It also dramatically reduces stranded cost charges thus guaranteeing even greater bill reductions for customers.

As a result of divestiture, DOER estimates that customers may realize a 20% overall reduction in their electric bills by the end of the first year of retail choice. This is an increase over the initial 10% guaranteed standard offer discount first proposed by NEES and the Attorney General's Office in mid-September. With the freedom to choose their own supplier of electricity, and competition among these suppliers, customers who select one of these competitors may realize an even greater savings

RESTRUCTURING: Continued on page 6.

BETTER BUILDINGS PROJECT WINS $400,000 GRANT

DOER and the Board of Building Regulations and Standards (BBRS) have won $400,000 from the U.S. Department of Energy (DOE) to run a statewide code training and technical assistance program. The program, scheduled to start in 1997, will help builders, architects and code officials understand and implement the building code's energy efficiency standards.

The winning proposal, developed with the assistance of the Boston Edison Settlement Board, launches Phase II of the Massachusetts Better Building Project. The Project seeks to reduce energy costs in new construction by improving building code efficiency standards and implementation. The Project was created by DOER, BBRS and the Boston Edison Settlement Board in partnership with utilities, builders, architects and efficiency advocates.

Under the grant, DOER and BBRS will work with the partners and others to:

- Adopt cost-effective amendments to the code's efficiency standards for new commercial construction.
- Work with other states in the region to make building codes more consistent across state lines. Better consistency will help builders and architects

CODES GRANT: Continued on page 6.

FROM COMMISSIONER O'CONNOR:

The definition of *efficient* — "Acting or producing effectively with a minimum of waste, expense, or unnecessary effort" —could actually serve as a mission statement in our business lives. All of us seek to produce the outcomes we want with as little waste, expense and time as possible.

According to Stephen R. Covey, author of the best-selling book *The 7 Habits of Highly Effective People*, you should think of "...*effectiveness* with *people* and *efficiency* with *things*." The Division of Energy Resources (DOER) does both. Helping businesses increase the energy efficiency of their "things" allows their "people" to operate more effectively. Increased energy efficiency and human effectiveness improves the productivity and profitability of those businesses. That's good for customers, employees and investors.

Here in Massachusetts, the Weld-Cellucci Administration and the State Legislature have demonstrated their commitment to maintaining and improving the competitiveness of our business community. Together, we have implemented a variety of tax incentives and programs which retain and recruit businesses, help companies improve their bottom line and create jobs.

As part of this effort, DOER, an agency under the Department of Economic Development, operates various programs which help businesses reduce costs through energy efficiency. A case in point is our Energy Advisor Service, which provides flexible and comprehensive energy efficiency analyses to owners and managers of manufacturing facilities. Over the past 10 years, we have identified nearly $70 million dollars in efficiency improvements for more than 550 businesses in the Commonwealth.

Two other programs help schools, hospitals and local governments design and install efficiency improvements. The improved heating, lighting and insulation in their facilities, promoted by our Institutional Conservation Program and Energy Engineering Program, now save these institutions and municipalities an estimated $7 million ***every*** year.

Through the efforts of DOER and the Office of Technical Assistance, Massachusetts recently received $1.3 million in U.S. Department of Energy NICE^3 grants to help three businesses offset start-up risks for innovative technology demonstration projects that significantly conserve energy and, at the same time, reduce industrial waste, prevent pollution and improve industrial cost-competitiveness.

Another successful government program aimed at increasing the efficiency of the nation's businesses is the U.S. Environmental Protection Agency's Green Lights and Energy Star program. Implemented on the state level by DOER, Green Lights has 78 participating Massachusetts businesses which save, on average, more than 50% on their lighting bills.

Energy efficiency programs for businesses also help consumers. Every dollar saved by a company can mean lower prices on goods and services and, in time, the creation of an additional job. When combined with the savings generated by residential conservation programs, our citizens have more dollars to spend on purchasing other essential goods and services.

With the public's continuing concerns about the economy and employment, tense situations in the Mid-East threatening our oil supplies and major federal cut-backs, it is more important than ever to aggressively implement efficiency measures. DOER is proud to be a part of our State's continuing efforts to help businesses and consumers reduce energy use and save money.

CHIPPING AWAY AT ENERGY BILLS

In times past, advocates of wood heat talked about its triple heating efficiency. They said wood heats you three times — once when you chop it down, again when you split it and a third time when you burn it. Today's focus is less on body heat, and more on the new technologies that make wood a sensible and viable energy source worthy of new attention.

Because of technological advances in wood burning, and the renewable quality of wood, more and more businesses and institutions are taking a new look at wood as their main energy source. Consider the case of Mount Wachusett Community College (MWCC) of Gardner, Massachusetts.

Concerned about rising energy bills, officials at MWCC were interested in the feasibility of converting their all-electric heating and domestic hot water systems to systems fueled by wood chips. (See page 7 for an explanation of wood chip gasification systems.) The college's location in the heart of the state's most extensive forest land made the wood chip option more attractive. Their interest also led the Legislature's Special Commission on Forest Management Practices to designate the college as a potential biomass pilot site. The Commission called upon the biomass and energy efficiency technical expertise available from the Division of Energy Resources (DOER) to investigate the feasibility of a wood chip conversion at MWCC. (For more information on wood energy and the work of the Special Commission, see "Fire Up" story page 5)

DOER conducted a feasibility study at the college through its Energy Engineering Program (EEP). EEP provides technical assistance to help public entities evaluate their energy efficiency needs and secure third party financing for efficiency measures. DOER's study concluded that the conversion from electricity to wood chips would save Mt. Wachusett Community College over $275,000 per year — a remarkable 70% savings on its current heating, ventilating and air conditioning costs.

The estimated total costs for the wood chip

MT. WACHUSETT: Continued on page 6.

ENERGY EFFICIENCY TIPS FOR HOME AND WORK

According to the National Renewable Energy Laboratory, Americans spend more than $115 billion each year on fuel and electricity for their homes — heating and cooling accounts for 45%, water heating consumes 14% and appliances and other sources utilize about 41%. Lighting alone — for private, public and business sectors — accounts for 20% to 25% of all electricity consumed in the United States. Cutting costs, curtailing demand and reducing the air pollution generated by creating electricity are three important reasons for increasing energy efficiency.

Regardless of the size of our homes or workplaces, all of us can take steps to improve energy efficiency. Practice the following measures or "tips" and you, too, can help make a difference.

Adjust thermostats or install programmable thermostats. Turn down your heating thermostat and turn up the cooling thermostat, especially when the building is not occupied. If you install programmable thermostats, you will not need to remember to change the settings every time you come and go.

Reduce hot water temperature. Reducing the hot water temperature can decrease heat loss from your tank. Guidelines are 110° for washing hands and up to 130° for heavy dish-washing. For each 10° reduction in water temperature, there can be a three to five percent reduction in water heating energy consumption.

Install low-flow showerheads and faucet aerators. The less hot water used, the less energy needed. Low-flow shower heads can reduce hot water consumption for bathing by 30%.

Reduce lighting and install automatic lighting controls. Turn off all lights when not in use and remove lamps where there is more lighting than needed. Installation and practical use of automatic lighting controls, including sensors, can reduce energy consumption.

Switch to energy efficient bulbs and lamps. Replacing incandescent bulbs with compact fluorescent lamps (CFLs) can save up to 75% of the initial lighting energy. CFLs also last 10 to 15 times longer than incandescent bulbs.

Spruce up your surroundings. Clean fixtures, lamps, and lenses every 6 to 24 months by wiping off the dust. Clean or repaint small rooms every year and larger rooms every two to three years — dirt collects on wall and ceiling surfaces which reduces the amount of light they reflect. Clean air vents, baseboards and radiators regularly. Check and replace air filters every two to three months and clean the refrigerator coils every three to four months.

Wrap the hot water tank and hot water pipes with insulation. Easy to install, pre-cut "blankets" or "jackets" for hot water heaters are widely available and reduce heat loss from the tank. Insulating hot water pipes with 1/2 or 3/4 inch diameter polyethylene sleeves, particularly those exposed in unheated spaces, can prevent hot water from losing its heat to the surrounding space.

Tune-up heating systems. Tune-up oil-fired heating systems every year and gas-fired systems every two years. Regular tune-ups cut heating costs and increase the lifetime of a system. They also reduce the amount of pollutants that your furnace or boiler puts into the air.

Seal heating and cooling ductwork. Leaks in joints, elbows and connections, especially those exposed to unheated or uncooled areas, can result in a 20% - 30% heating or cooling loss. Vinyl backed fiberglass works best as a sealing mechanism in these instances.

Insulate, Insulate, Insulate! Insulate walls, attics, and floors that are over unheated spaces.

Fix-up windows and doors. Repair broken or cracked glass and reputty older windows. Make sure window locks close properly and hold sashes together. Caulking and weather-stripping all windows, doors and attic hatches can save more than 10% on energy bills.

Purchase energy-efficient equipment. Compare energy guide labels on major appliances and purchase those that are most efficient. Look for and purchase computers and other office equipment tagged with the Energy Star label.

Repaint building exteriors with light colors and use light colored roofing materials. Lighter colors reflect sunlight and lower air-conditioning expenses.

Landscape property to maximize indoor heating and cooling systems. Carefully positioned trees, which block summer sun and winter winds, can save up to 25% of a household's energy consumption for heating and cooling. The trees also help the environment by processing carbon dioxide.

Sources: U.S. Department of Energy, Renewable Energy Laboratory, U.S. Environmental Protection Agency, MA Division of Energy Resources.

NEW ENERGY BUSINESS OPPORTUNITY: TRADE MISSION TO TURKEY

Lieutenant Governor Argeo Paul Cellucci will lead Massachusetts businesses on a Trade Mission to Turkey, December 1-8, 1996. The mission, which is open to companies of all sizes, is cosponsored by the Massachusetts Office of International Trade and Investment (MOITI) and the Massachusetts Port Authority.

With a market of more than 60 million people, Turkey presents substantial economic opportunities for Massachusetts companies. Designated as a "Big Emerging Market" by the U.S. Department of Commerce, Turkey currently has billions of dollars in energy, telecommunications and environmental projects open for bidding.

For more information and an application, contact Kathleen Molony or Brent Krueger at MOITI, (617) 367-1830.

A Bridge To The Future

by Paul Gromer, Executive Director, Northeast Energy Efficiency Council

Facts and opinions expressed in this editorial are those of the author and not necessarily those of the Division of Energy Resources.

Massachusetts utility energy efficiency programs are the greatest energy policy success of the last decade. Known as demand side management (DSM) programs, they have saved energy at half the cost of generation, helped to preserve clean air and water, and saved and created thousands of jobs.

However, the effort to restructure the utility industry has prompted a debate about the future of DSM. Stated in the most extreme terms, the debate breaks down as follows:

On one side, there are those who argue that we will not need DSM because the market will provide all the conservation that is economically efficient. They see DSM programs as a relic of the past, highly-regulated industry.

From the other side, we hear "don't throw out the baby with the bathwater." This group points out that DSM programs have provided great benefits and that it would be a mistake to discard this successful element of the current system. They argue that the market will not produce optimal levels of efficiency because restructuring will not remove the market barriers to energy efficiency.

In fact, DSM remains a very powerful tool that can create enormous benefits in the new world -- just as it did in the old. However, restructuring will fundamentally alter the energy industry. We cannot continue exactly the same DSM programs as if nothing had changed. As DSM advocates recognize, we must do more than simply save the baby. We need to reshape the baby. We need to fit DSM to the new industry structure.

A first step is to identify the objectives for DSM in a restructured industry. Then, DSM programs can be tailored to meet those objectives. I would like to propose the following seven objectives for DSM in a restructured utility industry.

1. *Create the future of energy efficiency and the energy efficiency industry.* With forward-looking DSM programs a decade ago, Massachusetts utilities and utility regulators sowed the seeds of the efficiency industry. Massachusetts efficiency companies created new products and services in order to deliver Massachusetts DSM programs. As DSM swept the country, companies in Massachusetts were then able to sell those products and services in states from here to California, creating thousands of jobs in our own back yard. If we use DSM to look forward rather than back, we can stay ahead of the curve. We can ensure that the next generation of energy efficiency jobs is created in this state, rather than somewhere else.

2. *Protect the environment.* DSM programs have proven to be a highly effective, and low cost, environmental strategy. By reducing energy consumption, power plants need to operate less frequently and thus the associated air emissions are also lowered. DSM can help us meet environmental requirements, and do so while *reducing* overall energy costs.

3. *Help low income customers.* DSM programs for the low income sector reduce energy bills for those customers and are an effective way to fulfill our obligations to those most in need.

4. *Bring the newest technologies to market, faster.* DSM programs pull the newest technologies into the marketplace. The high efficiency T-8 lamps and electronic ballasts that light much of the Commonwealth's commercial space are a case in point. DSM can continue to speed the trip from design table to marketplace, to the benefit of both Massachusetts consumers and manufacturers.

5. *Keep market energy prices down.* In a restructured industry, previously regulated energy prices will rise and fall with supply and demand conditions. Recent experience with wholesale electric prices and with Boston Edison's retail competition pilot program has shown that even slight increases in demand can send prices sharply higher. DSM programs will help to moderate demand increases and keep market energy prices down.

6. *Eliminate market barriers to energy efficiency.* Restructuring will not remove many of the classic market barriers to energy efficiency. For example, we will still have split incentives between landlords and tenants, lack of access to capital, and other barriers that prevent the market from delivering economically efficient levels of conservation. DSM programs can be targeted to address these remaining barriers and eliminate them where possible.

7. *Maintain the energy efficiency industry through the transition to a restructured industry.* Over time, restructuring will create vast new opportunities in the market for energy efficiency outside of utility DSM programs. However, in the short term, the prospect of restructuring has made that market dramatically worse. Restructuring has created great uncertainty about future energy prices, and price uncertainty kills efficiency projects. DSM programs will maintain the industry through this transition period until the market for efficiency reaches its potential.

Demand Side Management programs should be a bridge to our future, not a tie to the past. We need only adjust the objectives of DSM to fit the new industry structure, and tailor the programs to advance those objectives. If we do, we will create jobs, protect the environment, and reduce energy costs and we will create the greatest energy policy success of the next decade.

AN AUDIT TO LOOK FORWARD TO

The auditors are coming to your house and it's not your financial records that interest them. Instead they'll be checking out your heating system, walls, attic, refrigerator, dishwasher, stove, stereo, TV, and that electric blanket that keeps you warm on those cold winter nights. "Huh?" you say, "You mean it's not the IRS?"

These examiners are actually energy auditors — representatives of the no-fee Energy Conservation Service (ECS) program administered by the Division of Energy Resources. These professional energy purveyors can help you — homeowners, building owners and tenants — make your home more energy efficient. Just this past year, more than 50,000 Massachusetts households benefited from this program.

The ECS program is available to all residential customers through their local utility companies. ECS provides whole-house energy audits; demonstrations of low-cost, energy conserving do-it-yourself materials (low-flow shower heads, weather stripping, hot water tank wrap, etc.); assistance in finding qualified energy conservation contractors; technical assistance; and free inspections of energy conservation installations. (Ed. Note: A statewide effectiveness evaluation of the ECS program is currently underway. Results will be published in an upcoming *Energy Report*.)

The newest component of the ECS program is the Appliance Efficiency Education Service. DOER developed this service to help consumers understand how appliances, and entertainment, home office and personal comfort equipment affect their energy bills.

The Appliance Efficiency Education Service can teach you to:

- Inventory the appliances in your home and estimate energy consumption ranges for each appliance.
- Estimate the cost of running each appliance.
- Reduce appliance energy consumption.
- Choose an efficient appliance by reading the Energy Guide Labels, calculating lifetime operating costs, and understanding the energy saving features on large appliances.

According to India Hoeschen-Stein, a Certified Energy Manager with DOER, "The Appliance Efficiency Education Service is a valuable addition to the ECS audit. It clears up customers' misconceptions about which household appliances use the most energy and empowers them to make conscious energy conservation decisions."

For more information on the Appliance Efficiency Education Service or the Energy Conservation Service Program, contact India Hoeschen-Stein, C.E.M. at (617) 727-4732 ext. 131 or contact her via e-mail at ihoeschen-stein@state.ma.us.

STATE LOOKS TO FIRE-UP WOOD ENERGY

Sit back and imagine the flames of a wood fire licking at the walls of a fireplace, crackling and generating sparks as it burns. To many, this is a warm, wonderful and comforting image. To others, burning wood represents a cumbersome and time consuming task, with high capital costs of equipment and dirty emissions. Fortunately, however, many of these negative aspects have changed.

In the past ten years, energy and heating technologies have increased the reliability, affordability and convenience of using wood. Homeowners and industry alike have safer and environmentally cleaner wood burning options from which to choose. New wood stoves are Environmental Protection Agency certified and cleaner burning. Also, the advent of wood gasification (for technical explanation see page 7) makes large-scale wood energy projects cleaner and less expensive than all-electric systems.

Wood is a biomass fuel — that is, a biological matter that can be burned to produce energy. Other biomass sources are waste (municipal solid waste, manufacturing waste and landfill gas) and alcohol fuels (mostly derived from corn). An attractive feature of biomass fuels is that they are readily available in large quantities. According to Jim MacArthur, Chief Arborist for New England Electric System (NEES), NEES harvests 60,000 tons per year of wood from their roadside clearing operations. Add clearing done by other utilities, municipalities, state agencies and developers, as well as "residue"

WOOD: Continued on page 7.

HELP WANTED:
Drivers to Lease EVs

Position: DOER is looking for individuals interested in the cutting edge of technology to participate in the country's largest electric vehicle demonstration program.

Description: Leases cost $200 per month and include registration, insurance and basic maintenance fees. Cars are equipped with a cellular phone for emergencies. The program will install an electrical outlet at your home for overnight charging. Outlets for daily re-charging are available at Braintree and Alewife T-stations.

Benefits: Cruise silently by gas station while others queue up to fill their tanks. Contribute to a cleaner environment — electric cars have zero emissions and use no gas, oil or anti-freeze.

Qualifications: Drivers must use the vehicle as part of their daily commute and incorporate some form of ride-sharing — an official car pool or driving to accessible public transportation. Must have a good driving record and fill out a monthly survey.

To Respond: Contact Steve Skiffington, DOER's Electric Vehicle Program Manager, at (617) 727-4732 ext. 167, or e-mail at sskiffington@state.ma.us.

MT. WACHUSETT: Continued from page 2

system are just over $2.2 million. This includes construction of a 3500-square-foot heating plant with chip storage and all equipment. With energy savings figured in, the project will payback in eight years.

"If this project works as well as predicted," says Irving Sacks, Senior Policy Analyst at DOER and the agency's biomass specialist, "we may see more public facilities turning to wood for their energy." According to Sacks, the wood gasification system will be both 'environmentally friendly' and less expensive (particularly when compared to electricity). "These conversions can save money in public buildings. And, by so doing, we generate economic gains for the state, and for the taxpayers who foot the bills," Sacks added.

For more information on Biomass Energy Sources, contact Irving Sacks, Senior Policy Analyst, at (617) 727-4732 ext. 132 or e-mail him at isacks@state.ma.us.

DOER recently completed an energy audit of six Boston Housing Authority facilities that identified over $1 million in annual energy and water savings. Here, DOER's Energy Engineering Program consultants discuss facility conditions with Boston Housing Authority and Division of Housing and Community Development representatives.

ELECTRIC RESTRUCTURING: Continued from page 1

than the 20% reduction.

This settlement follows the DPU's announced extension of the date for issuance of its Final Order and Rules for electric industry restructuring. In postponing the Final Order until the end of the calendar year, the DPU seeks to host five more public meetings, work in concert with the Legislature's efforts to produce legislation and statutory reforms, and encourage stakeholders to work toward producing settlements.

Even with the initial NEES settlement, there is still a great deal that needs to be accomplished to ensure a smooth transition to a restructured industry. DOER will be working with the state's other investor-owned utilities to reach their own settlements. In addition, the DPU must still promulgate generic rules to implement customer choice by January 1998.

Copies of the various filings, written comments and DPU Order 96-100 are accessible through the Internet at http://www.magnet.state.ma.us/dpu/.

For more information on electricity issues, contact DOER Director of Policy Fran Cummings or Vicki Pitluk, Director of Public Information, at (617)727-4732.

ELECTRIC RESTRUCTURING PUBLIC MEETINGS

October 15 - Worcester
Worcester Public Library
3 Salem Square

October 29 - New Bedford
Sergeant Carney Academy
247 Elm Street

October 30 - Lowell
Mayor's Reception Room
City Hall

November 6 - Marston Mills
East School Auditorium
760 Osterville-West Barnstable Rd.

All meetings are scheduled for 7:00 p.m.

For more information, contact the Department of Public Utilities at (617) 305-3500.

CODES GRANT: Continued from page 1

who work in several states to meet code requirements and cut costs.

- Conduct a case study of Massachusetts' efforts to develop, support and adopt enhanced energy codes. The findings will be used to help other states build partnerships, leverage resources and reduce energy costs in new construction.

A 1995 grant from the U.S. DOE helped the Better Buildings Project identify cost-effective upgrades to the efficiency standards for new residential buildings and replacement windows. The amendments, proposed in May, are now under consideration by the Board of Building Regulations and Standards. Estimates show that the upgrades, if adopted, would save Massachusetts residents $5.1 million in annual energy costs by 2001.

For more information, contact Diane Daily, Acting Deputy Commissioner, at (617) 727-4732, ext. 152 or Tom Riley, BBRS Code Development Manager, at (617) 727-3200, ext. 650.

WOOD: Continued from page 5

(bark, green sawdust, etc.) from wood processing facilities, and it is evident that there is a vast supply of material to fuel wood energy systems -- without destroying forests. And, with proper forestry management, trees keep growing. Therefore wood, unlike fossil fuels, continues to renew itself.

The increased use of wood as a fuel has additional benefits:

It stimulates the local economy.

- The cutting, hauling, and chipping of wood, as well as end-use operations, create jobs and income. The Northeast Regional Biomass Program reported in 1995 that the wood energy industry in the Northeast contributed a net job creation of 34,000 jobs and a net regional income of $1.8 billion in 1992.
- The state acquires tax dollars through sales of wood and related equipment.
- Wood burning helps municipalities deliver less waste to landfills and processing sites, and save money through reduced fees.
- Massachusetts also offers the Forest Products Trust Fund. Under this statute, the Department of Environmental Management pays each eligible community a defined portion of the revenues from timber harvesting on state lands within municipal borders.

It encourages better forest management.

Using more wood for energy encourages both state and private land owners to clear fallen trees from their land; remove smaller, less useful trees; and stimulate the growth of stronger, healthier trees.

It reduces dependence on foreign oil supplies.

In 1992, Massachusetts residents and businesses burned 1.1 million tons of wood fuel — saving the equivalent of nearly 1.7 million barrels of oil.

It is environmentally friendly.

Wood has a negligible sulfur content, so its combustion does not contribute to acid rain. When combined with proper forestry management, which helps maintain the balance of carbon dioxide in the atmosphere, burning wood with new efficient technologies results in no net increase to the greenhouse effect. Additionally, the ash produced from wood burning systems is useful for agricultural purposes.

Recognizing these benefits, Massachusetts State Senator Robert Wetmore (D - Worcester, Hampden, Hampshire and Franklin), proposed legislation to establish a Special Commission on Forestry Management Practices. Adopted as part of Chapter 38 of the Acts of 1995, the Commission seeks ways to promote better use of waste and low quality wood found in abundance in Massachusett's forests. It is expected that their efforts will result in healthier and more valuable forests and improved wildlife habitats.

According to a July 1996 report issued by the Commission, Massachusetts possesses 2.9 million acres of commercial forest, comprised of 85% private and 15% public lands. (Massachusetts' total land area consists of 65% forested land, up from 29% a century ago.) To better utilize this resource, the report recommends that the Legislature fund an updated Continuous Forest Inventory (CFI). The inventory would provide vital timber data, including the volume available by species, health conditions and growth rates. It has been nearly 20 years since Massachusetts conducted a similar analysis. An updated CFI will be of enormous value to both private forest land owners and the forest industry as a whole. It will also help the state in its ecosystem management.

The Commission issued two other recommendations. In light of the upcoming deregulation of the electric utility industry, the Commission called for the Legislature to direct the Commonwealth's purchasing agent to establish a preference, when possible, in favor of electricity produced by wood-fired generation facilities. Second, the Commission recommended that a large-scale wood energy pilot project be conducted at Mt. Wachusett Community College (See "Chipping Away At Energy Bills" page 2).

The Special Commission on Forest Management Practices is also working on:

- A new Forest and Wood Products Education and Development Center.
- A Wood in Transportation Pilot Project, to promote the use of wood in bridges, guard rails, sign and light posts, and retaining walls.
- Protection of old growth forests.

David O'Connor, Commissioner of DOER, stated that developing and maintaining a diverse pool of energy sources, including wood, is important to the economic future of Massachusetts. "When making plans to meet future energy demands, we're looking to increase the mix of renewable sources," said O'Connor. "We can use our local and abundant wood supplies to help meet these needs and reduce our dependence on high-emission fuel sources."

For more information on biomass energy sources, contact Irving Sacks, Senior Policy Analyst, at (617) 727-4732 ext. 132 or e-mail him at isacks@state.ma.us.

WOOD CHIP GASIFICATION

A (wood chip) gasifier is a combustion device that cooks the wood fuel in a oxygen-starved environment, producing unburned combustible gases. The gases are then cooled and cleaned to produce a medium-BTU content gas, which can be used much like natural gas. The resulting bio-gas... can be combusted for heating and ....electricity generation.[1]

[1] *Wood Chip Heating Systems.* p. 58. 1994. Prepared by Maker, Timothy M., and Energy Efficiency Associates for the Northeast Regional Biomass Program, CONEG Policy Research Center, Washington, DC.

FALL WINTER '96 '97 CALENDAR

NOVEMBER

6 DPU Electric Restructuring Public Meeting, Marston Mills, MA. Contact the DPU at (617) 305-3500.

6-8 World Energy Engineering Congress, Atlanta, GA. Sponsored by the Association of Energy Engineers. Contact Ted Kurklis at (770) 925-9648.

15-16 Dimensions of Sustainability, Cambridge, MA. Sponsored by the MIT Department of Architecture. Contact Professor Andrew Scott at (617) 253-7171.

17-20 Fuel Cell Seminar, Orlando, FL. Sponsors: U.S. Department of Energy, National Aeronautics and Space Administration, Electric Power Research Institute, Gas Research Institute, and the U.S. Army Corps of Engineers. Contact Annemarie Pitman at (202) 639-4994.

21 Energy & Environmental Council, Westborough, MA. Bi-monthly committee meeting of the Associated Industries of MA, at Bay State Gas Co. Contact Keith McCoy at (617) 262-1180.

DECEMBER

5-6 International Symposium on Energy and Environmental Management & Technology, Newport Beach, CA. Sponsored by the National Academy of Sciences and Engineering. Contact Professor M. Mansouri at (714) 824-5973 or visit their website at http://www.gsm.uci.edu/ICREMT/.

11-13 North American EV & Infrastructure Conference, San Diego, CA. Sponsored by the Electric Vehicle Association of the America's. Contact Pam Turner at (415) 548-9464 or visit their web site at www.evaa.org.

JANUARY, 1997

25-29 American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRE) Winter Meeting and Exposition, Philadelphia, PA. Contact ASHRE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

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Suggestions, calendar submissions and questions are invited. Send to Editor, *Energy Report*, Massachusetts Division of Energy Resources, 100 Cambridge Street, Room 1500, Boston, MA 02202. Call us at (617) 727-4732, e-mail us at energy@state.ma.us or visit our website at http://www.magnet.state.ma.us/doer/.

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